MCASP LLD

Release Notes

TEXAS
INSTRUMENTS

Contents

MCASP LLD version 01.01.00.15

Overview

This document provides the release information for the latest MCASP Low Level Driver which should be used by drivers and application that interface with MCASP IP.

MCASP LLD module includes:
- Pre-compiled library for DSP Little Endian of MCASP LLD
- Source code
- API reference guide
- Design Documentation

LLD Dependencies

LLD is dependent on following external components delivered in CSL/LLDs package:
- CSL
- EDMA3 LLD

New/Updated Features and Quality

Release 1.1.0.15

- o Added Audio loopack test examples for J721E-EVM

- o Fixes for Static analysis issues

Release 1.1.0.14

- o Added support for SMP

- o Fixes/Enhancements for J7

Release 1.1.0.13

- o Added support for AM75xx

- o Fixes for packaging

Release 1.1.0.12

- Common driver code for v0/v1 versions with EDMA/UDMA separation.
- Device loopback test restructuring for stability

Release 1.1.0.11

- Add support for AM65XX
- Fix CPP compiler errors
- Add regression test application for AM65XX.
- Increase RX frame buffer size in device loopback example

Release 1.1.0.10

- Added configuration option to set & get bit clock divider
- Bug fix for delete-reopen channels

Release 1.1.0.9

- Add runtime configurability of channel parameter wordWidth
- Fixes for dra7x examples

Release 1.1.0.8

- Added support for AM574x
- Added audo codec loopback example for AM335x
- Misra-C fixes.
- Updates for gcc 6.3.1 and sysbios

Release 1.1.0.7

- Modifications to example projects including.
  - Fixes for clock tick speed & clock frequency in the sysbios configuration files
  - Disable uart prints (unless for debug purposes) while the mcasp frame transfers are set in motion, until the end of the test
- Clean up unused declaration in mcasp_drv.h & moved Mcasp_deviceInit() in to mcasp_soc.h

Release 1.1.0.6

- Bug fixes for OMAPL137x and DRA7xx.

- Enhancements to device loopback test to send/receive ramp per timeslot/serializer.

- Update to the K2G examples to remove dependency on platform library

Release 1.1.0.5

- Support for DMA Throttling fifo depth >1

- Added support for OMAPL137, OMAPL138

- Added support for registering interrupts for error handling. The driver now includes parameters for configuring the mux (CIC/crossbar) which the application may provide according to the system configuration.

- Added support for socGetConfig() and socSetConfig() to set soc specific parameters

- Common example source code across all EVMs with better documentation.

- Removed the need for mcasp_osal.c which was to be defined by the application earlier. The driver now uses Osal library.

- Fix for bug in IOCTL_RESET command

  NOTE: There has been some changes in the API pertaining to the below

    1) Redundant hwInfo.intNum has been removed and doesn't need to be set by the application

    2) The C66 versions need to include Event combiner and the AM5xx SOCs would need to include vayu\crossbar sysbios library

Release 1.1.0.4

- Fixed an issue with data format Mcasp_BufferFormat_MULTISER_MULTISLOT_SEMI_INTERLEAVED_1

- Support for FIFO with multiple serializers (Note: The DMA Throttling fifo depth=1)

- Fix for McASP driver call back function changing the input argument within the driver. The call back function will now pass on the inArg unchanged to the application. The examples's call back function (mcaspAppCallback) have been changed to reflect this.

- Moved many API #defines to mcasp_drv.h so that the application need not include mcasp_loc.h anymore.

- Added support for DRA78x. An audio loopback example also have been added for DRA78x.

- Added a new demo for K2G & AM572x: Audio_Equalization which adds an interactive EQ functionality (via UART terminal) to the audio loopback example.

Release 1.1.0.3

- o Synched with the McASP driver used by Automation. This brought in several bug fixes and a features such as
  - o EDMA Loopjob
  - o Using CSL-FL functions instead of CSL-RL
  - o Bug fixes detailed in PRSDK-948
- o Klockwork and MISRA-C fixes

Synched with the McASP driver used by Automation. This brought in several bug fixes

Release 1.1.0.2

- o Added support for AM335x, AM437x and AM571x
- o Enabled the device Loopback mode in the McASP driver
- o Added examples to demonstrate device loopback for AM335x,AM437x , AM571x , AM572x.
- o Added audio loopback example (similar to AM572x) for AM437x

Release 1.1.0.1

- o Added support for A15 on AM572x
- o Added support for K2G

Release 1.1.0.0

- o Initial release of MCASP low level driver for integration with PDK & PROC-SDK (RTOS)

Licensing

Please refer to the software Manifest document for the details.

Delivery Package
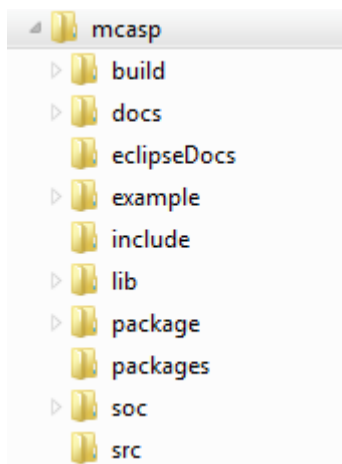
There is no separate delivery package. The MCASP LLD is being delivered as part of LLDs package inside PDK for RTOS-PROC-SDK.

Installation Instructions

The LLD is currently bundled as part of PDK package. Refer installation instruction to the release notes provided for PDK.

Directory Structure

The following is the directory structure after the MCASP LLD package has been installed:

The following table explains each individual directory:

Directory Name	Description
ti/drv/mcasp	The top level directory contains the following:- 1. *Environment configuration batch file* The file "setupenv.bat" is used to configure the build environment for the MCASP low level driver. 2. *XDC Build and Package files* These files (config.bld, package.xdc etc) are the XDC build files which are used to create the MCASP package. 3. *Exported Driver header file* Header files which are provided by the MCASP low level driver and should be used by the application developers for driver customization and usage.
ti/drv/mcasp/build	The directory contains internal XDC build related files which are used to create the MCASP low level driver package.
ti/drv/mcasp/soc	The directory contains the device(soc) specific files for the MCASP low level driver.
ti/drv/mcasp/docs	The directory contains the MCASP low level driver documentation.
ti/drv/mcasp/example	The "example" directory in the MCASP low level driver has the Audio Loopback example.
ti/drv/mcasp/include	The "include" directory has private MCASP low level driver header files. These files should not be used by application developers.
ti/drv/mcasp/lib	The "lib" folder has pre-built Little Endian libraries for the MCASP low level driver along with their *code/data size information*.
ti/drv/mcasp/package	Internal MCASP low level driver package files.
ti/drv/mcasp/src	Source code for the MCASP low level driver.

Example Sample Applications

The section documents information about the examples located in the MCASP LLD package.

MCASP Audio Example

This sample application demonstrates the use of the MCASP driver for audio playback. The MCASP driver supports only DMA mode of operation. The Mcasp sample application supports both c66 & A15 projects, called
`MCASP_Audio_<evmAM572x/evmK2G>_c66ExampleProject` and
`MCASP_Audio_<evmAM572x/evmK2G>_armExampleProject` that can be built using pdk's projectcreate script.

The application uses the MCASP LLD to program the AIC codec on the AM572x/K2G GP-EVM board to receive and playback the audio input.

Steps to run the MCASP Audio example

Here are the steps to run the demo on a AM572x/K2G EVM.

1. Audio test setup:
   - ➢ Connect the EVM's stereo audio input to the PC's stereo audio output
   - ➢ Connect the EVM's stereo audio output to powered speakers. Please make sure the amplification on the speakers is high enough for the audio output to be heard.

2. Build the example & run:
   - ➢ Run pdkProjectCreate to create the `MCASP_Audio_<evmAM572x/evmK2G>_<c66/arm>ExampleProject`
   - ➢ Load the project on to CCS and build the same.
   - ➢ Build the example
   - ➢ Load the `MCASP_Audio_<evmAM572x/evmK2G>_<c66/arm>ExampleProject` **.out**
   - ➢ Run the example
   - ➢ Please note that it takes about 10-20 seconds to perform initialization. Please look for the string "`EDMA driver initialization PASS`" to appear on the CIO console.

3. Playing the audio:
   - ➢ Play an audio file on the PC.
   - ➢ You should be able to hear the same audio on the speakers connected to the EVM. It is the PC's audio output which is loop backed at the EVM's MCASP example outputed to the speakers.
   - ➢ NOTE: Please make sure the speakers' output volume is high enough for the audio to be audible.

     Please note that SLAVE mode of the MCASP driver is not supported in this release. The MASTER mode is enabled by default.

MCASP Device Loopback Example

This sample application demonstrates the use of the MCASP driver in loopback mode (at the serializer). The MCASP driver supports only DMA mode of operation. The MCASP device loopback sample application namely
`MCASP_DeviceLoopback_<evmAM572x/idkAM571x/evmAM437x/evmAM335x>_<c66/arm>ExampleProject` can be built using pdk's projectcreate script.

The application puts the MCASP in loopback mode and sends/receives a digital ramp and checks for correctness. This demo doesn't need a AIC codec or an external input/output for audio samples.

Steps to run the MCASP Device Loopback example

Here are the steps to run the demo on a AM572x EVM,for example.

1. Build the example & run:
   - ➢ Run pdkProjectCreate to create the `MCASP_DeviceLoopback_evmAM572x_<c66/arm>ExampleProject`
   - ➢ Load the project on to CCS and build the same.
   - ➢ Build the example
   - ➢ Load the `MCASP_DeviceLoopback_<evmAM572x/evmK2G>_<c66/arm>ExampleProject` **.out**
   - ➢ Run the example (Please note that it takes about 10 seconds to run the test to completion)
   - ➢ Please look for the string "`All tests have passed`" to appear on the UART console, console which indicates a successful completion of the test.
   - ➢ A failure will print a "TEST FAIL".

Customer Documentation List

Table 1 lists the documents that are accessible through the **/docs** folder on the product installation CD or in the delivery package.

Table 1   Product Documentation included with this Release

Document #	Document Title	File Name
1	Design Document	docs/MCASP_LLD_SDS.pdf
2	Software Manifest	docs/MCASP_LLD_SoftwareManifest.pdf